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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/904,105   | 07/13/2001  | Toshiki Tachikawa    | 107292-00023        | 1324             |
| 4372   | 7590        | 01/26/2006           | EXAMINER            |                  |
| ARENT FOX PLLC<br>1050 CONNECTICUT AVENUE, N.W.<br>SUITE 400<br>WASHINGTON, DC 20036 |             |                      |                     | NGUYEN, LAM S    |
|  |             | ART UNIT             |                     | PAPER NUMBER     |
|  |             | 2853                 |                     |                  |

DATE MAILED: 01/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

|                 |                  |  |
|-----------------|------------------|--|
| Application No. | 09/904,105       |  |
| Examiner        | TACHIKAWA ET AL. |  |
| LAM S. NGUYEN   | Art Unit<br>2853 |  |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 10 November 2005.  
2a) This action is FINAL.                    2b) This action is non-final.  
3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-10 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) Claim(s) 7-10 is/are allowed.  
6) Claim(s) 1 and 3-6 is/are rejected.  
7) Claim(s) 2 is/are objected to.  
8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
10) The drawing(s) filed on 13 July 2001 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) All    b) Some \* c) None of:  
1. Certified copies of the priority documents have been received.  
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) Notice of References Cited (PTO-892)  
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) Notice of Informal Patent Application (PTO-152)  
6) Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 3/1, 5/1, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by M.

Pavlovic (BEAM OPTICS STUDY OF THE GRANTRY BEAM DELIVERY SYSTEM FOR LIGHT-ION CANCER THERAPY) (The reference was submitted by the applicant on 09/25/2001).

Pavlovic discloses a charged-particle beam irradiator (*FIG. 1a*) comprising:

*a plurality scan electromagnets for one direction (page 16, third paragraph: Two scanners for one direction that is for the bending plane. The first scanner deflects the beam away from the axis, the second one brings it back) provided on an entrance side of a final deflection electromagnet (FIG. 7: The scanners X1-2, Y are placed at the entrance of the final deflection electromagnet (bending magnet) indicated as BEGINNING OF BEND-DOWN DIPOLE) to scan a charged-particle beam to expand an irradiation field, and*

*a controller controlling the plurality of said scan electromagnets so that kicks provided by the plurality of said scan electromagnets are combined in said one direction to form a collimated irradiation field at an exit of said final deflection electromagnet (page 16, third paragraph: The scanners are controlled to deflect the beam such that the local point of the bending magnet (the final deflection electromagnet) is hit, so even parallel scanning occurs).*

**Referring to claim 3/1:** wherein said plurality of scan electromagnets (*Fig. 4, elements 100, 110*) are interposed between said final deflection electromagnet (*Fig. 6-7: The bending magnet at about 16-18 m*) and a deflection electromagnet (*Fig. 6-7: The bending magnet at about 7-8 m*) disposed on an entrance thereof.

**Referring to claim 5/1:** wherein said plurality of scan electromagnets disposed independent of each other in X and Y directions (*FIG. 7*).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3/1, 4/1, 5/1, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akiyama et al. (US 6218675) in view of M. Pavlovic (BEAM OPTICS STUDY OF THE GRANTRY BEAM DELIVERY STSEM FOR LIGHT-ION CANCER THERAPY).

Akiyama et al. discloses a charged-particle beam irradiator comprising a plurality scan electromagnets (*Fig. 4, elements 100, 110*) provided on an entrance side of a final deflection electromagnet (*Fig. 4, element 9*) to scan a charged-particle beam to expand an irradiation field.

a controller controlling the plurality of said scan electromagnets so that kicks provided by the plurality of said scan electromagnets to form a collimated irradiation field at an exit of said final deflection electromagnet (*column 8, line 40 to column 9, line 27: The beam is outputted from the bending electromagnet 9 (the final deflection electromagnet) in a direction parallel to the design center trajectory of the beam (column 9, lines 20-23)*).

Akiyama et al., however, does not disclose wherein the plurality of scan electromagnets is for one direction.

Pavlovic discloses a charged-particle beam irradiator (FIG. 1a) comprising a plurality scan electromagnets for one direction (*page 16, third paragraph: Two scanners for one direction that is for the bending plane. The first scanner deflects the beam away from the axis, the second one brings it back*) provided on an entrance side of a final deflection electromagnet (FIG. 7: *The scanners X1-2, Y are placed at the entrance of the final deflection electromagnet (bending magnet) indicated as BEGINNING OF BEND-DOWN DIPOLE*) to scan a charged-particle beam to expand an irradiation field.

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to modify the charged-particle beam irradiator disclosed by Akiyama et al. so the scanning electromagnets are for one direction as suggested by Pavlovic. The motivation for doing so would have been to drive the beam to hit the bending magnet at its focal point in order to obtain even parallel scanning as taught by Pavlovic (*column page 16, third paragraph*).

**Akyama et al. also discloses the following claimed inventions:**

**Referring to claim 3/1:** wherein said plurality of scan electromagnets (*Fig. 4, elements 100, 110*) are interposed between said final deflection electromagnet (*Fig. 4, element 9*) and a deflection electromagnet (*Fig. 4, element 6*) disposed on an entrance thereof.

**Referring to claim 4/1:** wherein said plurality of scan electromagnets (*Fig. 4, elements 100, 110*) are disposed upstream from a deflection electromagnet (*Fig. 4, element 8*) disposed on an entrance of said final deflection electromagnet (*Fig. 4, element 9*).

**Referring to claim 5/1:** wherein said plurality of scan electromagnets (*Fig. 4, elements 100, 110*) disposed independent of each other in X and Y directions.

***Allowable Subject Matter***

3. Claims 7-10 are allowed and claims 2, 3/2, 4/2, and 5/2 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The reasons for allowance of claims 2 and 7 were indicated in the previous office action.

Claims 3/2, 4/2, 5/2, and 8-10 are allowed because they depend directly/indirectly on claim 2 or 7.

***Response to Arguments***

Applicant's arguments in light of Declaration under 37 C.F.R. 1.132 (11/10/2005) with respect to claims 1 and 6 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN  
01/19/2006

*Hai Pham*  
HAI PHAM  
PRIMARY EXAMINER